STATEMENT OF WORK

Development of E-learning Modules

Contents

1. Scope

This Statement of Work (SOW) describes the requirements for the development and delivery of self-standing interactive E-learning Modules based on the IAEA Milestones approach, as described in the Nuclear Energy Series document "Milestones in the Development of a National Infrastructure for Nuclear Power, NG-G-3.1, 2007 (Applicable Documents [1]) and other IAEA documents for newcomer countries. The E-learning Modules shall provide capabilities to support training and assessment of knowledge for educational, training and information sharing purposes.

1.1 Background

The number of IAEA Member States (MS) requesting assistance in considering and introducing nuclear power programmes has increased significantly in recent years. As MS take decisions to start nuclear power programmes and begin building the necessary infrastructure, the development of sufficient numbers of adequately trained human resources becomes a high priority. They are requesting that the IAEA develop additional services in more technical areas to support them. Building on the experience of other IAEA programmes, applying E-learning tools in conjunction with regional strategic partnerships can demonstrate a sustainable model for support for the IAEA's infrastructure programme.

Thus, the development and deployment of an E-learning system will meet this need and will leverage other IAEA efforts such as the Asian Network for Education in Nuclear Technology (ANENT), as well as other international networks and forums under development. Training modules will be selected that will provide countries embarking on nuclear power programs access to knowledge and information about the fundamentals of nuclear power as well as issues related to the IAEA's milestones in the development of a national infrastructure for nuclear power. Thus, it will lay the foundation for them to be able to more fully participate in IAEA workshops and make better use of guidance documents, as well as developing their knowledge base. This approach leverages the IAEA's expertise by making its information accessible via modern platforms.

Member States may have problems providing satisfactory (nuclear) Education and Training due to:
- Lack of prior need (Newcomers)
- Inadequate long-term planning
- Low levels of funding and other resources, and
- A lack of suitable infrastructure.

Hence E-learning can be an efficient way to deliver knowledge to newcomers.

In the context of this project ***E-learning*** is defined as:

Interactive learning material which is delivered enabled or mediated in mixed-media format (text, animations, videos, audio, etc.) by information and computer technologies (ICT).

Lessons learned from the accident at the Fukushima-Daiichi NPP will also be incorporated into the training modules, including an increased focus on topical issues such as safety, siting, environmental monitoring and emergency response, to the extent that these topics are included in the developed modules. It should be noted that although an E-learning approach may make the training programmes more efficient, it is not intended to be a substitute for bringing people together with experts in a classroom setting. On the contrary, the networking and informal discussions that happen in a live

setting are essential to facilitating understanding. This project is intended to supplement and enrich regional or national training activities, by enabling individuals to reach a predetermined level of knowledge, making face-to-face interactions more effective.

Content will be developed that will support, and be consistent with, the training and guidance provided by the IAEA with respect to building a nuclear power infrastructure. The focus will be on developing content for knowledge and information about the fundamentals of nuclear power as well as issues related to the IAEA's milestones in the development of a national infrastructure for nuclear power. A special emphasis will be placed on leadership and management of nuclear power infrastructures activities, since having well-trained leaders and managers will support the success of the overall programme.

Training modules will be based on IAEA guidance and standards, including the Nuclear Energy series documents (NES), Nuclear Safety Standards (NSS), and other IAEA publications. All E-learning materials will be initially developed only in English. In order to facilitate Member States use, it is planned to subsequently translate the already developed E-learning materials and supporting documentation into the IAEA languages used in many countries, for example Arabic, French and Spanish.

1.2 Outcomes of the project

The objective of this project is to develop E-learning content for newcomers. By the end of March 2013 the target outcomes of this project are:

1. "Basic course on Considerations to launch a new nuclear programme" *(working title only – final title to be confirmed during project)*

2. "Advanced course modules on Nuclear Power Infrastructure Issues" (4 different modules – *working title only – final title to be confirmed during project)The already chosen topics for modules are:*

   - *National position*
   - *Human resources*
   - *Management of new nuclear project*
   - *Stakeholder involvement*

3. Optionally, additional modules would be developed as well as the translation of the already developed modules into different languages like Arabic, French and Spanish.

1.2.1 Phase 1 - Basic course on Consideration to launch a new nuclear programme

The "Basic course on Consideration to launch a new nuclear programme" module will provide basic information about the IAEA Milestones approach (Applicable Documents [1]). The material will have four main parts:
1. Background: The programme to develop infrastructure milestones
2. Phases 1-3 (from the IAEA document: "Milestones in the Development of a National Infrastructure for Nuclear Power, Ref. [1])
3. Role of the NEPIO and other organizations in new nuclear programme
4. An brief overview of the 19 infrastructure issues: (Additional information and details are available on these issues in Reference [1] listed in the Applicable Documents Section)

1. National position
2. Nuclear safety
3. Management
4. Funding and financing
5. Legislative framework
6. Safeguards
7. Regulatory framework
8. Radiation protection
9. Electrical grid
10. Human Resources development
11. Stakeholder involvement
12. Site and supporting facilities
13. Environmental protection
14. Emergency planning
15. Security and physical protection
16. Nuclear fuel cycle
17. Radioactive waste
18. Industrial involvement
19. Procurement

The length of this module will be determined by the agreed level of detail but is expected to be approximately 1-2 hours and it shall include text pages, videos, animations, tests and interactive exercises. The first module will be seen as a '*marketing outreach campaign*' to IAEA MS requesting assistance in considering and introducing nuclear power programs. All the modules shall be easy to access and use, attractive and as interactive as possible.

The content of this module will be defined using Systematic Approach to Training (SAT) based tools (Reference [2] listed in the Applicable Documents Section). A more detailed description of the content will be provided to the Contractor, after the contract has been placed.

1.2.2 Phase 2 - Advanced course modules 1-4 on Milestones

Advanced course modules 1-4 on Milestones will give more detailed information than basic course about the four chosen issues. In the first phase of the project only 4 of the 19 Infrastructure issues will be developed into E-learning Modules, based on availability of information and deemed priority in the Milestones approach. Each of those E-learning Modules will address the chosen topic on a detailed level including practical examples and case studies and will include tests and interactive practices. The lengths of these advanced E-learning Modules will vary depending on the topic. The IAEA has chosen the first four issues. The chosen issues are (more information is available Reference [1] listed under the Applicable Documents Section):

1. *National position*
2. *Human resources*
3. *Management of new nuclear project*
4. *Stakeholder involvement*

1.2.3 Optional Phase 3

Optionally, there will be a **Phase 3** that would include additional modules as well as the translation of the already developed modules into different languages like Arabic, French and Spanish.

2. Schedule

The Contractor's key team shall participate in a project kick-off meeting which will take place on 13-14th September 2012. During the time from 17 to 28 September 2012 the IAEA will be conducting a number of consultancy meetings in Vienna regarding the content of modules (these dates are still tentative and will be confirmed to the Contractor). At this time the key Contractor team shall be present and actively participate in the meetings to get a full understanding of the content and provide expert advice to facilitate the later development of the E-learning Modules.

The basic E-learning Module (Phase 1) shall be delivered by Mid December 2012 and the remaining E-learning Modules described in Section 1.2 shall be delivered by End of March 2013.

3. Target audience of the modules

The E-learning Modules shall have the capabilities to educate and assess the knowledge of the following main target groups:

- The Decision makers, advisers and senior managers in the governmental organizations, subject matter experts, utilities, industries, and regulatory bodies of Member States interested in developing nuclear power;

- Future participants of IAEA events (for example IAEA training courses, workshops, technical meetings, Consultancy meetings, IAEA missions to MS) to ensure/upgrade their knowledge about the Milestones approach;

- To train and familiarize future IAEA staff-members on the Milestones approach.

It is important to note that the audience will vary, in particular for later Modules, based on the content of the module.

4. Learning objectives of the modules

The E-learning Modules are planned to cover the introduction to "the IAEA milestones approach" (basic course) and more detailed information about the infrastructure issues in the "advanced modules". The overall learning objectives for these modules are:

- To increase the knowledge of the target audience in the "milestones approach" and the long commitment a nuclear power programme requires;

- To familiarize the target audience with the selected infrastructure issues and increase their engagement in, and commitment to, safe, security and sustainable nuclear power programme in their country.

Training objectives for the subject areas identified by the IAEA shall be developed by the Contractor and agreed with IAEA at an early stage of the project.

5. Applicable Documents

The following IAEA and other international organizations' documents (but not limited to these) shall be used in the development of the E-learning Modules:

[1] INTERNATIONAL ATOMIC ENERGY AGENCY, Milestones in the Development of a National Infrastructure for Nuclear Power, IAEA Nuclear Energy Series, NG-G-3.1, IAEA, Vienna (2007)

[2] INTERNATIONAL ATOMIC ENERGY AGENCY, Nuclear Power Plant Personnel Training and its evaluation, Technical Report Series No.380, IAEA, Vienna (1996)

These documents are available from the IAEA webpage: www.iaea.org.

6. Definitions, Acronyms, and Abbreviations

The following definitions, acronyms, and abbreviations shall apply throughout this SOW unless defined otherwise hereinafter:

End-User   The IAEA and its Member States

E-learning   E-learning is a method that utilizes available technologies to facilitate learning. This method of learning utilizes networks to deliver learning content, enable interaction between users, and generally facilitate the learning process from both teacher and student perspectives. E-learning employs written, audio and visual content to deliver learning content that can be accessed with a computer anytime anywhere. An E-learning Module is a manageable ensemble of E-learning content on some specified topic.

In the context of this project E-learning is defined as:

Interactive learning material which is delivered, enabled or mediated in mixed-media format (text, animations, videos, audio, etc.) by information and computer technologies (ICT).

E-learning Module   A collection of E-learning materials under one specified topic. One E-learning course can include several E-learning Modules.

SCORM   **Sharable Content Object Reference Model** (**SCORM**) is a collection of standards and specifications for web-based E-learning.

The following abbreviations are used in this SoW:

h/w	Hardware
IAEA	International Atomic Energy Agency
ISO	International Standards Organization
MS	Member States to IAEA
NEPIO	Nuclear Energy Programme Implementing Organization
NPP	Nuclear Power Plant
PP	Project Plan
SAT	Systematic Approach to Training
SOW/SoW	Statement of Work
s/w	Software

7. Requirements

7.1 General Requirements

The Contractor shall develop and deliver five (5) E-learning Modules based on the content defined by the IAEA. The modules shall be based on world-wide good practices and international experience in E-learning methodology and tools.

The E-learning Modules shall include, as a minimum, the following general features and functions:

- Simple and consistent navigation that guides the learner in a simple and user friendly manner through all lessons (easy to use, consistent and easy to access);

- The E-learning Modules shall be pedagogically aimed at the target audience (adults, senior decision makers) and shall support and motivate them in the learning process; the manner in which the content is presented shall attract them and entice them to read more and to want to continue with the other modules;

- Effective use of mixed-media formats, i.e. text, audio, video, animation, interactive games and tests, appropriately combined to the learning aspects being delivered;

- The E-learning Modules shall have a professional appearance and shall conform to the IAEA Visual Identity rules;

- The E-learning Modules shall be gender, race, religion, and politically neutral;

- The E-learning Modules shall allow independent navigation across different modules;

- The training material in the E-learning Modules shall be organized or generated as a training course;

- Learning objectives shall be achieved through learning information content followed by testing of the learning objectives, to ensure understanding;

- The E-learning Modules shall be developed with due consideration of the systematic approach to training methodology (SAT) (Applicable Documents [2]);

- IAEA relevant publications shall be used as the reference material for the E-learning Modules.

7.2 Functional and Technical requirements for the E-learning Modules features and functions:

The E-learning Modules shall include, as a minimum, the following technical features and functions:

- The E-learning Modules shall be developed in compliance with the Sharable Content Object Reference Model, SCORM 2004 4th Edition or later;

- Each E-learning Modules shall be designed to be delivered in, at least, the following ways:
    - As a cross-platform Web-Based Training (WBT) module that can be hosted on a SCORM certified Learning Management System (LMS);
    - As a stand-alone, self-contained Computer-Based Training (CBT) module distributed on DVD and running on a local computer under Windows XP/ or Vista or Windows 7 (or later) or Mac OS X 10.7 (or later) operational system;

- Ability to track progress through the modules and to restart at the same location, if training was halted or not fully completed. It shall be apparent to the user which sub-modules or lessons he or she has already visited and which modules he or she has successfully completed;

- The E-learning Modules shall provide start, stop, pause functions and cue points to control animations and videos;

- Volume controls shall be managed with global volume settings;

- A Glossary of important terminology shall be accessible from the menu and via context sensitive links directly from the text;

- The E-learning Modules shall provide full text search capabilities through all the modules as well as metadata based search (for graphics, audio, video, etc.);

- The E-learning Modules shall include Tutoring options where appropriate.

7.3 Requirements for Assessment of the Learning Progress

The E-learning Modules shall have tools for assessment of learning results based on the learning objectives provided by IAEA, as described in Section 7.1, and that shall include, as a minimum, the following features:

- A trainee's progress and understanding shall be determined utilising tasks (tests) that are engaging and varied, containing at least some of the following functions (but not limited to these):
    - Multiple choice questions;
    - Click to answer tasks: clicking on elements in graphics and passive animations;
    - Random selection of questions from pool of questions;
    - Limited time (time function and display);
    - Limited number of attempts (with display);
    - A scoring system;
    - Single choice (with text, graphics and passive animations);
    - Sorting or putting things in the correct order (e.g. steps in the process);
    - Drag and Drop Tasks, i.e. moving elements with the mouse to a designated place;

- Functions such as presentation of information;
- Feedback informing the learner whether the solution of a task was correct or incorrect;
- Hints to the learner about possible ways to solve a task;
- Detailed feedback to the learner after completion of a task. Recommending documents for required reading or self-study for particular subjects or training objectives;

- Assessment of a trainee's knowledge and independent navigation shall be mandatory functions, whereas diagnostics, correction and tutoring will be desirable but not mandatory (i.e. optional functions).

7.4 Requirements for the work

The Contractor shall carry out the following activities:
- The Contractor shall develop, for acceptance by the IAEA, an implementation plan for the delivery of E-learning Modules to the IAEA;

- The Contractor shall develop computer based E-learning Modules described in Section 1.2 or other modules and materials as agreed with the IAEA in writing;

- The Contractor shall create and record Audio portions of the E-learning content as appropriate;

- The Contractor shall create the glossary of important terminology;

- The Contractor shall create and include tools as specified above for assessment of learning results;

- The Contractor shall maintain an online bug tracking tool and shall provide access for the IAEA to this tool. The IAEA shall be able to directly file issues in this tool. Issues filed by Contractor shall be visible to the IAEA. The bug tracking tool shall provide information about what features have been resolved in what software version;

- The Contractor shall maintain a quality assurance log for all deliverables and shall share this log with the IAEA;

- The Contractor shall train two to four (2-4) IAEA staff to be capable of maintaining, updating and modifying the E-learning Modules, after the first E-learning Module is handed over and accepted by the IAEA; and

- The Contractor shall report on the performance criteria as agreed in the implementation plan.

7.5 Other Requirements (Intellectual Property Rights, Licenses)

The E-learning Modules shall meet following requirements:
- The IAEA shall acquire all exclusive rights, including all transferable intellectual property rights (IPR) and use rights, in the deliverables, including their specification, algorithms, architectural approach and technical solution and specifically all rights in software, sources and comments as contained therein. Such rights shall include the absolute right to develop, modify or have modified such software;

- There shall be no licence fees, once the E-learning Modules are handed over to the IAEA;

- There shall be no limits on the number of users that can use the E-learning Modules.

7.6 Requirements for Contractor Capability

The Contractor shall meet the following requirements:

- The Contractor shall have experience and evidence of two successfully (formally accepted by a Customer) developed and delivered, of similar size or bigger, E-learning Modules to an external Customer(s) in the last 2 years;

- The Contractor shall provide evidence that the Project Manager and the key team is sufficiently competent to develop and deliver the required E-learning Modules;

- The Project Manager of the Contractor shall have 3 or more years of experience in leading comparable E-learning projects;

- The Creative Director responsible for the overall creative concept of the Contractor (e.g. learner interface design, animation and art work) shall have 3 or more years of experience in comparable E-learning projects.

7.7 Language requirements

The Contractor shall meet the following language requirements:

- The language of all project correspondence and acceptance activities shall be English. All deliverables and project documentation shall be in English;

- The Project Manager and other key persons of the Contractor shall have fluent English (spoken and written) skills;

- Any audio portions in the E-learning materials, added by the Contractor, shall be recorded by a native or a fluent speaker of the language being recorded (English for phases 1 and 2).

7.8 Software and Hardware requirements

The Contractor shall meet the following software and hardware requirements for the E-learning Modules:

- Regular computer users with limited permissions (i.e. not necessarily administrators) shall be able to install and run the E-learning Modules;

- The need to install any software not contained on the distribution media shall be avoided;

- User interface shall be developed by Contractor. The user interface shall allow future customization;

- The E-learning Modules shall be supplied with a software shell having the capacity and capability for future modifications, configuration management and for further update by IAEA staff. IAEA staff shall be trained by the Contractor to obtain the knowledge, tools and the rights to make modifications;

- The Contractor shall guarantee the availability of maintenance service for the E-learning Modules for a minimum of one year;

- The E-learning Modules shall meet general requirements stated for training information systems in ISO, IEC, IEEE and other standards in this field;

- The source code for the applied system shall be supplied. If the applied system does not have a source code, the associated software shell environment shall have the capability to enable modifications to be implemented;

- The possibility to run and use the E-learning Modules under iOS and Android will be desirable.

8. Deliverable Data Items

The Contractor shall deliver the following data items:

- The final project plan for the implementation of Phase 1 and Phase 2 and upon request services thereafter;

- The manner in which a quality product shall be ensured (Quality assurance plan);

- E-learning Modules described in Section 1.2;

- User guide for the E-learning Modules described in Section 1.2;

- Administration Guide (including installation, modification, settings and configuration of the E-learning Modules);

- Report of the findings and actions from the pilot-phase of the project;

- Project reports and records, as agreed in the project plan, in written format twice a month and, on request, more frequently during the development phase of E-learning Modules;

- Final project report (summary) at the end of the project. This report shall include description of the project and of the deliverables and any key lessons learned during the implementation of the project;

- Training material for training of two to four (2-4) IAEA staff to maintain and update the modules.

Attachments:
Attachment 1 – Other relevant documents

Attachment 1

Other relevant documents

A. INTERNATIONAL ATOMIC ENERGY AGENCY, Managing the First Nuclear Power Plant Project, IAEA-TECDOC-1555, IAEA, Vienna (2007)

B. INTERNATIONAL ATOMIC ENERGY AGENCY, Evaluation of the Status of National Nuclear Infrastructure Development, NG-T-3.2, IAEA, Vienna (2008)

C. INTERNATIONAL ATOMIC ENERGY AGENCY, Basic Infrastructure for a Nuclear Power Project, IAEA-TECDOC-1513, IAEA, Vienna (2006)

D. INTERNATIONAL ATOMIC ENERGY AGENCY, Nuclear Power Programme Planning: An integrated Approach, IAEA-TECDOC-1259, IAEA, Vienna (2001)

E. INTERNATIONAL ATOMIC ENERGY AGENCY, Managing Human Resources in the Field of Nuclear Energy, IAEA Nuclear Energy Series, NG-2-2.1, IAEA, Vienna (2009)

F. INTERNATIONAL ATOMIC ENERGY AGENCY, Safety of Nuclear Power Plants: Design Safety Requirements, Safety Standards Series NS-R-1, IAEA, Vienna (2000 – in the English language, 2003

G. INTERNATIONAL STANDARD ORGANIZATION, Quality management systems – Requirements, ISO 9001:2008, ISO, London (2008)

H. INTERNATIONAL STANDARD ORGANIZATION, Quality management systems – Fundamentals and vocabulary, ISO 9000:2005, ISO, London (2005)

I. INTERNATIONAL STANDARD ORGANIZATION, Quality management - Guidelines to quality in project management, ISO 10006:2003, ISO, London (2003)

J. INTERNATIONAL STANDARD ORGANIZATION, Guidelines for quality management systems management documentation, ISO 10013:2001, ISO, London (2001)

K. INTERNATIONAL ATOMIC ENERGY AGENCY, IAEA Safety Glossary, Vienna (2007)

L. INTERNATIONAL ATOMIC ENERGY AGENCY, IAEA Safeguards Glossary, Vienna (2001)

M. INTERNATIONAL ATOMIC ENERGY AGENCY, Fundamental Safety Principles, Safety Standards Series SF-1, Safety Fundamentals, IAEA, Vienna (2006)

N. INTERNATIONAL ATOMIC ENERGY AGENCY, Recruitment, Qualification and Training Personnel for Nuclear Power Plants, Safety Standards Series NS-G-2.8, Safety Guide, IAEA, Vienna (2002)

O. INTERNATIONAL ATOMIC ENERGY AGENCY, Safety culture, Safety Series No. 75-INSAG-4, IAEA, Vienna (1991)

P. INTERNATIONAL ATOMIC ENERGY AGENCY, Safety culture in nuclear installations, IAEA-TECDOC-1329, IAEA, Vienna (2002)

Q. INTERNATIONAL ATOMIC ENERGY AGENCY, Assuring the Competence of Nuclear Power Plant Contractor Personnel, IAEA-TECDOC-1232, IAEA, Vienna (2001)

R. INTERNATIONAL ATOMIC ENERGY AGENCY, Building Competence in Training in Radiation Protection and the Safe Use of Radiation Sources, Safety Guide, Safety Standards Series No RS-G-1.4, IAEA, Vienna (2002)

S. INTERNATIONAL ATOMIC ENERGY AGENCY, Occupational Radiation protection, Safety Guide, Safety Standards Series No RS-G-1.1, IAEA, Vienna (1999)

T. INTERNATIONAL ATOMIC ENERGY AGENCY, Selection, Competency Development and Assessment of Nuclear Power Plant Managers, IAEA-TECDOC-1024, IAEA, Vienna (1998)

U. INTERNATIONAL ATOMIC ENERGY AGENCY, Competency Assessment for Nuclear Industry Personnel, STI/PUB/1236, IAEA, Vienna (2006)

V. INTERNATIONAL ATOMIC ENERGY AGENCY, The Management System for Facilities and Activities, Safety Requirements, Safety Standards Series No. GS-R-3, Vienna (2006)

W. INTERNATIONAL ATOMIC ENERGY AGENCY, Application of the Management System for Facilities and Activities, Safety Guide, Safety Standards Series No. GS-G-3.1, Vienna (2006)

X. INTERNATIONAL ATOMIC ENERGY AGENCY, Commissioning for Nuclear Power Plants Safety Guide, NS-G-2.9, IAEA, Vienna (2004)

Y. INTERNATIONAL ATOMIC ENERGY AGENCY, Considerations to Launch a Nuclear Power Programme, IAEA, Vienna (2007)

All the listed documents are available from the IAEA webpage: www.iaea.org. The IAEA can also provide all the documents to the Contractor in CD-ROM.

_____